

Estrada^{EM}

Integrated Wafer-Level Test Cell for Electromigration

DATA SHEET



The Estrada™ turnkey wafer-level reliability (WLR) test system for electromigration (EM) accelerates reliability evaluation of integrated circuit interconnect technologies. This wafer-level implementation of conventional EM test provides a practical means of bypassing the packaging step required for traditional package-level reliability (PLR), yielding faster results which correlate well to baseline PLR data. Estrada-EM comprehensive WLR test cells for 300 mm wafers are designed specifically to meet the unique challenges of EM WLR requirements, such as very high temperatures and prevention of copper oxidation. These inclusive, pre-validated configurations simplify specifying, deploying, and supporting WLR EM.

Everything needed for intrinsic reliability testing of conventional constant-current EM and stress migration (SM) on the wafer is provided by the Estrada-EM high-performance integrated measurement solution; the industry's only integrated constant-voltage EM capability is also available. Estrada-EM systems marry the industry's gold standard for engineering probe stations (including innovative, patented PureZone™ nanochamber technology for oxygen-free testing) with a proven fast parallel reliability test system and high-performance probe cards. Don't risk delays or lose productivity when an optimized solution is already available from industry leader Cascade Microtech.

FEATURES / BENEFITS

Fast Results	No delays for packaging, delivering answers days to weeks earlier. High temperature (350°C) test capability to cut test time compared to other (300°C) WLR options. Oxygen-free PureZone nanochamber for testing partially processed wafers (no passivation/capping). Automatic, camera-based realignment after TCR temperature changes to eliminate waiting for operator. High-parallel DUT capacity for faster reliability study completion and better statistics.
Data Integrity	Continuous monitoring and fast sampling to capture momentary events (rapid void formation, self-healing). PLR correlation by using same accurate source measurement circuitry. Programmable compliance and CVEM capability to prevent false failures and enable failure analysis. Elimination of latent ESD and water damage to DUTs from dicing, bonding, and handling packages. Oxygen-free nanochamber environment which prevents copper oxidation during test.
Confidence	Fast path to first data with comprehensive, pre-validated solutions. Single source for specification, ordering, installation, and support. Worldwide support network, with local teams throughout Asia, U.S., and Europe.



BLP Packages



BLN Packages



BFP Packages

		For oxygen-free (purged) 300 mm semi-automated full-wafer testing	For non-purged (purge- ready) 300 mm semi- automated full-wafer testing	For oxygen-free (purged) 300 mm fully-automated full-wafer testing
For Constant Current EM, Constant Voltage EM, Low Frequency Pulsed EM and SM	25 mA per DUT, 10 V, 10 Hz	BLP-MPE package Up to 64 parallel DUTs	BLN-MPE package Up to 64 parallel DUTs	
For Constant Current EM and SM	±200 mA per DUT, 40 V	BLP-SEM package Up to 64 parallel DUTs	BLN-SEM package Up to 64 parallel DUTs	
	5 mA per DUT, 10 V			BFP-UHA-Q package Up to 64 parallel DUTs

SUBSYSTEM SPECIFICATIONS

Subsystem	Key Specifications
CM300xi-E probe station	<p>Semi-automated or fully-automated station.</p> <p>35°C~350°C chuck and thermal system for broad test temperature range.</p> <p>Patented PureZone nanochamber with nitrogen purge capability to remove oxygen from test environment.</p> <p>Shielded Microchamber® for low-noise measurements.</p> <p>eVue™ digital microscope and VueTrack™ technology for camera-assisted alignment and stepping , including automatic realignment after TCR temperature changes.</p> <p>Motorized large-area bridge for multisite probe alignment.</p> <p>Velox™ productivity software.</p> <p>See CM300xi data sheet and product highlights, as well as Velox product highlights.</p>
Material Handling Unit (MHU)	<p>FOUP/FOSB cassette compatibility.</p> <p>Up to two probe stations per MHU.</p>
Symphony full-featured reliability test system with Conductor software	<p>Modular, scalable, compact WLR test system.</p> <p>Up to eight Application Modules of mixed types for high-parallel DUT capacity system with Zeus reliability experiment software.</p> <p>Test executive software to automate test execution including stepping.</p> <p>See Symphony data sheet.</p>
Multipurpose EM Application Module ("MPE" packages only)	<p>Constant Voltage EM, Constant Current EM, Low Frequency Pulsed Current EM, and Stress Migration test algorithms.</p> <p>Up to 25 mA per DUT, 10 V, 10 Hz, high-accuracy multi-modal source measurement units (SMUs).</p> <p>Up to 16 DUTs in parallel per Module (128 max per Symphony).</p> <p>True parallel stress/measurement, >40 Hz sampling.</p> <p>See MPEM Module data sheet.</p>
Standard EM Application Module ("SEM" packages only)	<p>Test algorithms.</p> <p>Up to ±200 mA per DUT, ±40 V, broad operating range SMUs.</p> <p>Up to 16 DUTs in parallel per Module (128 max per Symphony).</p> <p>True parallel stress/measurement, >100 Hz sampling.</p> <p>See SEM Module data sheet.</p>
Ultra High Accuracy EM Application ("UHA" packages only)	<p>Constant Current EM and Stress Migration Module test algorithms.</p> <p>Up to 5 mA/DUT, 10 V, high-accuracy SMUs.</p> <p>Up to 16 DUTs in parallel per Module (128 max per rack-mount 1164).</p> <p>True parallel stress/measurement, >40 Hz sampling.</p> <p>See UHAEM Module data sheet.</p>
Celadon T350 probe card	<p>Up to 50 probes per test site.</p> <p>Up to dozens of edge-to-edge test sites per 300 mm multisite probe card optimized for target test temperature and TCE-compensated to match wafer thermal expansion.</p> <p>Up to 350°C continuous use.</p> <p>Sealed viewports to preserve oxygen-free environment and enable camera-based automatic card alignment.</p>

FACILITY REQUIREMENTS

For physical dimensions, AC power and other facility needs, and environmental considerations, see Estrada EM Facilities Planning Guide.

REGULATORY COMPLIANCE

CE certified, CB compliance tested, certified for US and Canada (cNRTLus)*, SEMI S-2 (BFP packages only). Thermal chuck and purge control accessories may require field labeling.

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WARRANTY

Warranty*	One year
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Service contracts**	Multi-year programs available
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** See Cascade Microtech's Terms and Conditions of Sale for more details.*

*** Service contracts cover Cascade Microtech equipment only – third-party items such as probe cards have manufacturer warranty only.*

ORDERING INFORMATION

Please contact your local Cascade Microtech sales representatives to configure and quote your system.

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Data subject to change without notice.

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Microtron®

Flexible electronic solutions

Microtron n.v. | Generaal De Wittelaan 7 | B-2800 Mechelen | T +32 (0) 15 29 29 29 | info@microtron.be | www.microtron.be
Microtron b.v. | Hoevestein 11 | NL-4903 SE Oosterhout | T +31 (0) 162 44 72 72 | info@microtron.nl | www.microtron.nl